



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/535,696	03/27/2000	Scott Arthur Jones	10001011-1	4175

22879 7590 05/01/2003

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

ROBUSTELLI, MICHAEL E

ART UNIT	PAPER NUMBER
----------	--------------

2697

DATE MAILED: 05/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/535,696

Applicant(s)

JONES ET AL.

Examiner

Michael E Robustelli

Art Unit

2697

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-Claim 12 recites the limitation "said step of the receiver waiting further" and "the repeater repeating the step of receiver checking for available data until data is available for transmission" on lines 1-3 of the claim. There is insufficient antecedent basis for this limitation in the claim. The claim makes more sense, and would overcome the rejection, if it amended to read "transmitter" in place of each occurrence of "receiver." For examination purposes it will be treated as reading "transmitter."

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2697

4. Claims 1-3, 5-6 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ben-Num et al. (U.S. Patent No. 5,633,867).

-Regarding claim 1, Ben-Num teaches of a receiver (112 of Fig. 4) sending to the transmitter (100 of Fig. 4) a virtual channel credit packet (128 of Fig. 4; Col. 5, lines 11-23) indicating that the receiver is available to receive data (Col. 5, lines 7-10). The transmitter and the receiver are in communication via a plurality of virtual channels, each being assigned with a unique virtual channel number (Col. 5, lines 46-50). The transmitter responding to the virtual channel credit packet transmits data ("another cell," Col. 5, lines 27-28) to the receiver if data is available (Col. 5, lines 24-28). Though Ben-Num does not explicitly show the receiver receiving the "another cell" transmitted from the transmitter, the receiver receiving the data implies it receives (Col. 5, lines 27-28).

-Regarding claim 2, Ben-Num teaches that the virtual channel credit packet is sent when the receiver has the available resources ("cells will have a buffer," Col. 5, line 9) to receive transmission data from the transmitter and is ready to do so ("okay to send," Col. 5, line 8).

-Regarding claim 3, Ben-Num teaches that the data includes the unique virtual channel number (68 and 70 of Fig. 3; Col. 5, lines 47-48) assigned to the particular virtual channel (Col. 5, line 49).

-Regarding claim 5, Ben-Num teaches of carrying a "credit," indicating the availability of a buffer in the receiver for a virtual channel (Col. 5, lines 7-10). The credit is stored by "credit return mechanism" that is a first-in/first-out buffer used to store credits to be returned the transmitter, for particular virtual channels (Col. 9, line 48 – Col. 10, line 4). Though Ben-Num does not explicitly show the receiver checking for

Art Unit: 2697

available buffer for transmission it is inherent that the receiver does this in order to produce credits to be placed in the "credit return mechanism." Ben-Num further teaches of not returning a credit for a cell received by the receiver and placing it into the stalled queue, where there is a stored variable for recording the number of credits not returned. These credits are then placed in the "credit return mechanism" when they are moved to the active queue (Col. 7, 50-63; Col. 9, lines 59-64), i.e. when the buffer is available, which will then send the virtual channel credit packet for the particular virtual channel once buffer is available (Col. 9, lines 65-66; Col. 5, lines 53-58). Therefore when the buffer is not available (stalled queue) the receiver waits a predetermined time, which is the time until the VC is moved to the active queue.

-Regarding claim 6, it's inherent in the design that the receiver repeating the step of checking for available buffer until a buffer is available because the system disclosed by Ben-Num returns the credits to the transmitter after they have been moved to the active queue (Col. 7, lines 61-63; Col. 9, lines 59-61), therefore a process of checking for this event must occur and be repeated so that credits can be returned.

-Regarding claim 16, Ben-Num teaches of a means for sending a virtual channel credit packet (128 of Fig. 4; Col. 5, lines 11-23) for a particular channel (Col. 5, lines 46-50) to the transmitter (100 of Fig. 4). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10). Ben-Num further teaches of a means for responding to the virtual channel credit packet and transmitting at least one data packet to the credit packet sending device ("another cell of VCI 106," Col. 5, lines 27-28). Ben-Num further teaches of an accepting means (receiver 118 of Fig. 4) for the at least one data packet from the data packet transmitting device

Art Unit: 2697

(102 of Fig. 4). Ben-Num further teaches of the virtual channel credit packet ("ATM cell 128," Col. 5, lines 24-28) having a unique virtual channel number (68 and 70 of Fig. 3; Col. 5, lines 47-48) assigned to the particular virtual channel (Col. 5, line 49).

-Regarding claim 17, Ben-Num teaches of a receiver being adapted to send a virtual channel credit packet (128 of Fig. 4; Col. 5, lines 11-23) for a particular channel (Col. 5, lines 46-50) to the transmitter (100 of Fig. 4). Ben-Num further teaches that the credit packet being indicative that the receiver is available to receive data (Col. 5, lines 7-10). Ben-Num further teaches of a transmitter being adapted to respond to the virtual channel credit packet and transmit at least one data packet to the credit packet sending device ("another cell," Col. 5, lines 27-28). Ben-Num further teaches of the receiver being adapted to accept the at least one data packet transmitted from the transmitter (Col. 5, lines 41-45). Ben-Num further teaches of the virtual channel credit packet ("ATM cell 128," Col. 5, lines 24-28) having a unique virtual channel number (68 and 70 of Fig. 3; Col. 5, lines 47-48) assigned to the particular virtual channel (Col. 5, line 49).

-Regarding claim 18, Ben-Num teaches that the virtual channel credit packet is further indicative of the receiver having an available buffer of sufficient capacity ("cells will have a buffer," Col. 5, line 9) to receiver a data packet from the transmitter ("okay to send," Col. 5, line 8).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (U.S. Patent No. 5,633,867).

-Regarding claim 7, Ben-Num as discussed with the rejection of claim 1, fails to explicitly teach of a transmitter checking for an available buffer, waiting a predetermined time if unavailable and looking for a virtual channel credit packet from the receiver if a buffer is available.

Ben-Num further teaches of a transmitter portion of a communications link (102 of Fig. 4; Col. 5, lines 2-4), and further teaches of the system designed such that there are "credits and buffers per VC" (Col. 4, lines 66-67) therefore there are buffers in the transmitter (102) assigned to a specific VC. Incoming data to a transmit buffer that is occupied would cause data collision if it were to enter before finishing with the previous data, resulting in corruption of data. Prematurely emptying the transmit buffer of its current data to allow incoming data is undesirable as it is what the system discloses by Ben-Num seeks to avoid through transmitting only when given permission through credits (Col.2, lines 21-34). Therefore it would have been obvious to check upon the availability of a transmit buffer, of data incoming on a specific VC, before accepting it into the buffer.

Additionally, The process carried out by a transmitter, such as cell transmission and SAR (Col. 3, lines 40-45), require a specific amount of time to be carried out,

therefore an unavailable transmit buffers state would only change after a period of time that would allow these processes to be carried out and the transmit buffer to free up space. Therefore, if the buffer were found unavailable it would have been obvious for the transmitter (102) to wait a predetermined time (sufficient for the processes to complete and free space in the buffer, before checking again).

Finally, Ben-Num teaches of the transmitter transmitting only when it has a credit on a particular virtual channel, which it receives from the receiver (Col. 5, lines 14-18, 21-23 and 27-28). It would have been obvious for a transmitter with a buffer available to transmit data to look for the receipt of a credit packet, so that transmit data can be transmitted when detected.

One of ordinary skill in the art would have been motivated to check for available buffers, wait a predetermined time when unavailable, and check for credits when available for a specific VC so that the transmit buffer can handle incoming data more efficiently and prevent data loss due to buffer congestion while waiting for transmit credits.

-Regarding claim 8, Ben-Num as discussed with the rejection of claim 7 above, fails to explicitly teach of the transmitter waiting further comprising repeating the steps of checking for an available buffer. As discussed above, it was obvious for the transmitter to check for an available buffer, and to wait a predetermined time if unavailable so that the necessary transmit processes may be performed on the buffers current contents. When the processes are complete and the buffer is made available (after a predetermined time), the buffer will be made available to new data to be transmitted on the VC, since transmitter are operable to transmit data more than once. Therefore it

would be obvious for the transmitter to repeat the step of checking the buffer so that when it has been detected as available new data may enter it for transmission. One of ordinary skill in the art would have been motivated to do this so that data can enter the transmit buffer at the same rate that data is transmitted from it, making the transmit process more efficient and preventing congestion.

7. Claims 4 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ben-Num et al. (U.S. Patent No. 5,633,867) in view of Bennett (U.S. Patent No. 5,610,745).

-Regarding claim 9, Ben-Num as discussed with the rejection of claim 7 above, further teaches of a "null cell" where the received data does not contain a credit (Col. 5, lines 59-62). According to the system disclosed by Ben-Num, when the transmitter has no credits on a VC it is not allowed to transmit data (Col. 2, lines 28-31), therefore it must wait a predetermined time, where that time is the time it take for an incoming cell to arrive containing a credit on the VC (Col. 2, lines 31-32). Ben-Num does not explicitly teach checking for available data for transmission if the virtual channel credit packet is found.

Bennett teaches of a similar system employing credit based flow (abstract) control checking for available data for transmission if the virtual channel credit packet is found (Steps 530-535-540-510 of Fig. 5; Col. 7, lines 23-33).

At the time of invention it would have been obvious to one of ordinary skill in the art to check for available data for transmission if the virtual channel credit packet is

found. One of ordinary skill in the art would have been motivated to do this so that when permission to transmit further data is given that data can be sent, if available.

-Regarding claim 10, Bennett further teaches of the transmitter repeating the step of looking for the virtual channel credit packet until the packet is found (510-515-530-510 of Fig. 5; Col. 7, lines 23-33). Where frames to transmit is yes, the credit counter is zero and no receiver ready signal has been received it will repeat 510 to 515 to 530 to 510 until a receiver ready signal is received.

-Regarding claim 11-12, Bennett further teaches of the transmitter waiting for a predetermined time if no data is available (510-530-535-510 of Fig. 5; Col. 7, lines 23-33), where the predetermined time is the time in which it data becomes available (when the answer to 510 becomes yes). Bennett further teaches of the transmitter repeating this until data becomes available (answer to 510 becomes yes) and then sending data if it is available (510-515-520 of Fig. 5).

-Regarding claims 4 and 13, though Ben-Num fails to explicitly teach of repeating the method according to claim 1 for the next virtual channel credit number until all virtual channels are running. Ben-Num teaches of the system operating "x" VC's simultaneously (Col. 2, lines 41-44). In order to establish multiple VC's simultaneously one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. However, it would have been obvious to one of ordinary skill in the art to do so. One of ordinary skill in the art would have been motivated to do this so that multiple connections can be established with out permanency, thereby increasing throughput and flexibility of handling bandwidth.

-Regarding claims 14 and 15, though Ben-Num does not explicitly show the receiver checking if said data has been received from the transmitter and waiting for a predetermined time if data has not been received. In order to receive data over the virtual channel the receiver must check if it has received any. Furthermore, if it has not received the data it must wait a predetermined time, that time being the time until the data does arrive. Therefore it is inherent in the design. Ben-Num further fails to explicitly teach of repeating the method according to claim 1 for the next virtual channel credit number. Ben-Num teaches of the system operating "x" VC's simultaneously (Col. 2, lines 41-44). In order to establish multiple VC's simultaneously one of ordinary skill in the art would have repeated the method of claim 1 until all available VC were operating. However it would have been obvious to one of ordinary skill in the art to do so. One of ordinary skill in the art would have been motivated to do this so that multiple connections can be established without permanency, thereby increasing throughput and flexibility of handling bandwidth.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- a. Ramakrishnan et al. (U.S. Patent No. 5,511,076) – discloses a credit-based flow control system for use in an ATM environment.

b. Barkey et al. (U.S. Patent No. 5,825,748) - discloses a credit-based flow control system.

c. Ben-Michael et al. (U.S. Patent No. 6,078,565) - discloses a credit-based flow control system for use in an ATM environment.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael E Robustelli whose telephone number is 703-305-8326. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 703-305-4798. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.



Michael E. Robustelli
April 21, 2003



RICKY NGO
PRIMARY EXAMINER